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The articles in this Journal are indexed in the *International Index to Periodicals* and in the *Canadian Index*.

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Canoe brigade setting out in the early morning mists of Lake Superior. This oil painting by Mrs. E. M. Hopkins is now in the possession of the Glenbow Foundation of Calgary.

Voyageurs' Highway

The Geography and Logistics of the Canadian Fur Trade

by ERIC W. MORSE

Photographs by the author unless credited.

This is the first of a series of three articles about the geography of the fur trade routes and what they have meant to the development of Canada.

TWO HUNDRED years ago, as today, the ice broke up on the Ottawa River around the first of May. In the heyday of the Montreal fur trade, the half century from 1770 to 1820, the first of May saw great activity at Lachine, eight miles above Montreal. "Brigades" of big Montreal canoes, or "canots de maître", each craft paddled by ten or a dozen colourfully dressed voyageurs, and carrying up to three tons of cargo, were loaded and began to move off for the "pays d'en haut".

They went straight west up the Ottawa River to Mattawa, where the Ottawa ends its big swing down from the north. Here they headed up the Mattawa River, and paddled and portaged forty miles to its source in Trout Lake, at North Bay. Three portages

over a rough divide led them into Lake Nipissing, from where it was easy going down the French River to Georgian Bay. After following the North Channel above Manitoulin Island, they portaged past Sault Ste. Marie and headed out around the treacherous 450-mile passage of the North Shore of Lake Superior.

About the end of June, after eight weeks of long days, great hazards and unremitting toil, they found themselves at their objective, Grand Portage. This was the great central entrepot of the Canadian fur trade, situated on a shallow bay of Lake Superior ten miles south of the mouth of the Pigeon River, the present international border. (Grand Portage was abandoned when the Americans made good their claim to the new boundary, and

from about 1803 its place was taken by Fort William.)

Grand Portage was the objective of the big "canots de maître" from Montreal, and a rendezvous. But it was not the end of the line. The other end of the "Voyageurs' Highway" was Fort Chipewyan on Lake Athabasca. The ice in that latitude did not break up quite as soon as on the Ottawa. Though the big northern lakes often were still iced over in June, the turbulent Athabasca River usually burst winter's bonds around May 15. Fort Chipewyan about then became a scene similar to Lachine a fortnight earlier. And while the Montreal canoes were paddling westward, the Athabasca Brigade was paddling eastward to meet the "canots de maître" at Grand Portage.

The waters west of Lake Superior on the whole were smaller, and two continental divides had to be crossed. The craft used here was the North canoe — high-ended, half the capacity, and paddled by six or eight men. On the trip east they carried, not trading goods, but bales of fur. Up the Athabasca River they paddled for 200 miles, leaving it at Fort McMurray (Waterways) to ascend the swift Clearwater. This stream they left after 80 miles, to cross the gruelling thirteen-mile Methye (La Loche) Portage, which brought them to the headwaters of the Churchill River. The Churchill was followed for some 400 miles to a point north of Cumberland House where Frog Portage led them over to the Sturgeon-weir River which (for its wicked rapids) the voyageurs called the Maligne. This carried them down to the Saskatchewan River, which they then followed to its mouth in Lake Winnipeg.

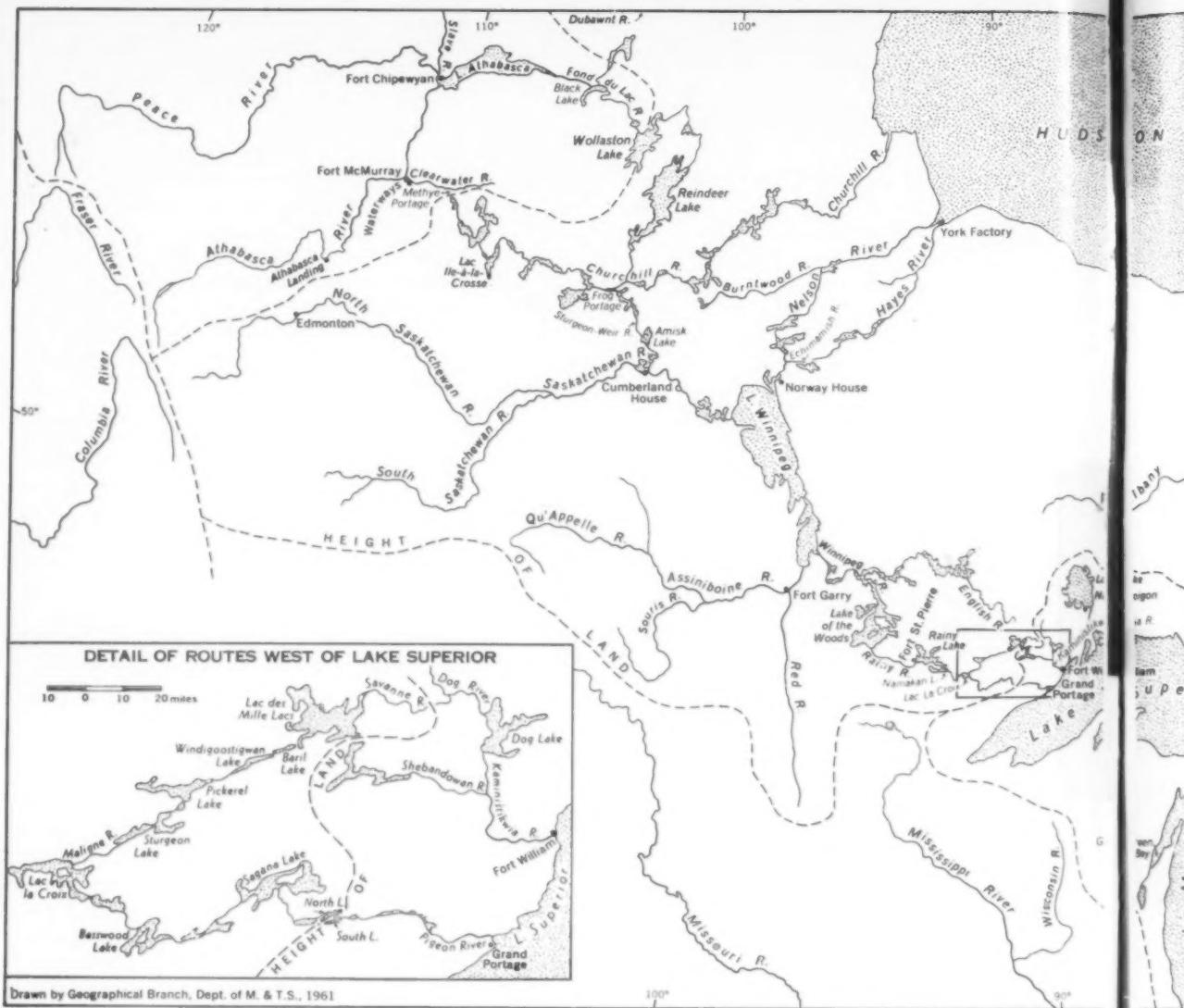
Most of this journey from Fort Chipewyan was downstream. There followed the passage of storm-tossed, shallow Lake Winnipeg, and then the laborious ascent of the Winnipeg River and its tributary the Rainy along the border-lakes chain. This led them to the divide, and over it to either Grand Portage or Fort William, the two routes separating at Lake La Croix a little to the east of Rainy Lake.

Along the way, the Athabasca Brigade would sometimes be joined by other less distant Brigades — those from Ile à la Crosse, Cumberland House, or Red River.

Actually, because of the greater distance, the Athabasca Brigade usually got only as far as Fort St. Pierre at the foot of Rainy Lake, where they were met by a special detachment from Grand Portage in mid-July and were allowed to get away on their two-months' home journey before the first of August. Otherwise, the reforwarding of some of their return cargo of trading goods from Fort Chipewyan to the outlying posts in the Mackenzie District could not be accomplished before freeze-up.

All this is of necessity a sketch and a simplification, taking no account of the fur trade's vicissitudes and the later modifications of the route. Nor does it attempt to bring in the avenue used by Canada's other fur-trading enterprise, the Hudson's Bay Company, which will be fitted into the picture later. Staked out here, however, is a water route, Canada's first and main through way, which has probably done more to shape Canada's history and development than any other of its avenues of communication. The *coureurs de bois*, the voyageurs and early explorers who first used this route are symbols of Canada's heroic or epic age; and few nations have so colourful and romantic a past. Many Canadians seem to be aware of the historical associations of this highway, without realizing that the actual route still lies hardly changed today: the scenery, the conditions of wind and current, nearly all the actual portages have scarcely altered in the three centuries since the first fur-seekers headed out from Quebec and Montreal for the "pays d'en haut".

The physical geography of this waterway and the logistics of the fur trade are as impressive as the saga itself. In an age before air travel, in a land devoid of road or rail, on a route beset with obstructions, dangers, and difficulties, how did men burdened with hundreds of tons of fur and trade goods succeed each year practically in crossing a continent and back again in the scant five months between break-up and freeze-up? How did they get across lakes like Winnipeg and Superior in craft of birch rind? How did they overcome the Rocky Mountains? Paddling and portaging often eighteen hours a day, how were the human engines refuelled as they crossed a wilderness? Most such



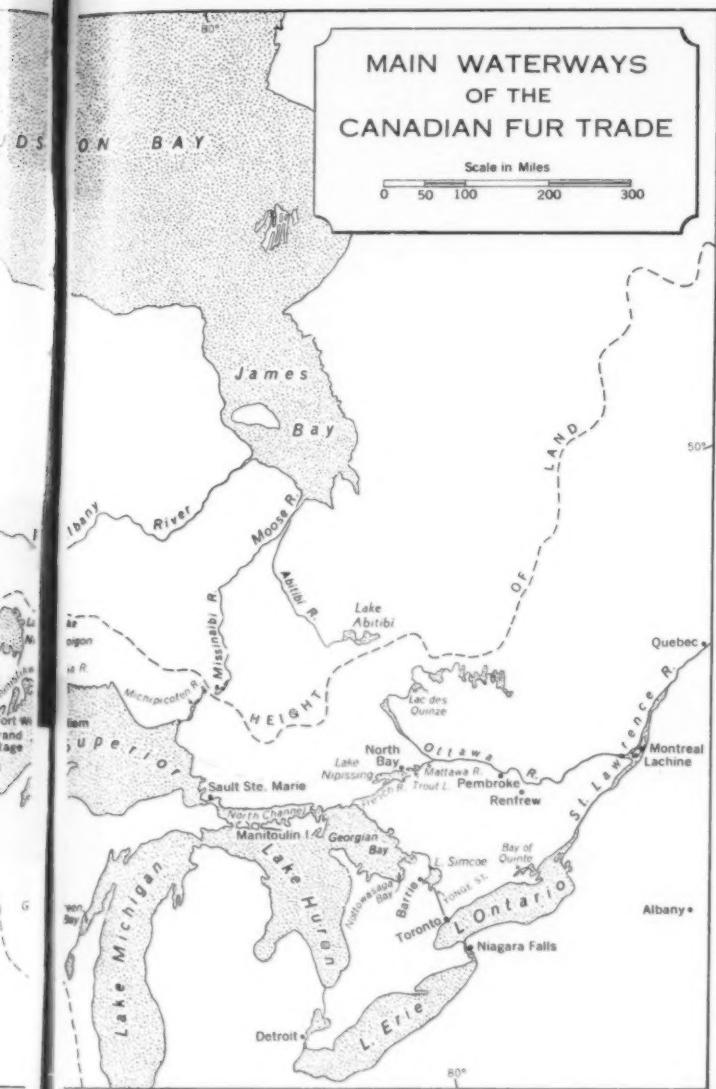
questions can be studied more concretely by retracing the route; it is a palatable proposition that sometimes as much history can be learned from a canoe as from a history book.

This survey is designed to cover the waterways of the fur trade, the overcoming of navigational obstacles, the logistics, and the influence of the fur trade on Canadian development.

I — The Waterways of the Fur Trade

It is a staggering statistic that half of all the fresh water in the world is to be found in

Canada. Put into other words, there are as many miles of inland waterways in Canada as in all the other nations of the world combined. And, for a craft adapted to the conditions, these waterways are navigable. It is still possible to put a canoe into the water in practically any Canadian city, and paddle from the Atlantic to the Pacific, or from the Arctic Ocean to the Gulf of Mexico. This is not, as in Europe, the result of man-made canals, but of a fantastic drainage-pattern consisting of three vast, shallow basins and three great "hubs".



The water from three-quarters of continental Canada drains off through three outlets: the Gulf of St. Lawrence (10%), Hudson Strait (43%), and the mouth of the Mackenzie (22%). Furs were gathered, of course, from the other quarter of the country, but the heavy transportation of furs and goods operated almost entirely within these three drainage areas.

While it is usual to speak of drainage basins, for this story it would be more accurate to refer to these three areas as drainage *saucers*. This helps to underscore the

low elevation of the rims, in relation to the vast areas encompassed. Twelve hundred miles from tidewater up the Great Lakes to Fort William is a rise of just 600 feet. Between the drainage areas, at no point is an interconnecting portage more than about 1500 feet above sea level; and the same holds for the several connecting gateways to the Mississippi Basin.

The combination of these three facts of Canadian geography explains much regarding the fur trade routes. Three quarters of Canada east of the Rockies presented no serious barrier to canoe travel.

This in turn is recognizably related to the presence of the worn down Precambrian Shield, covering half of Canada. The Shield with its countless systems of lakes and rivers — quite apart from its birch trees — is canoe country. Actually, for about 2000 of its total 3000 miles, the Voyageurs' Highway passed along, or close to, the Shield's southern border. The Ottawa River west to Renfrew, the north shores of Lakes Huron and Superior, the border lakes including Lake of the Woods, the Winnipeg River and Lake Winnipeg — all either form, or closely flank, the Shield's southern rim. West of Lake Winnipeg the old canoe route picks up the Shield once more in Amisk Lake on the Sturgeon-weir River, and stays just inside the Shield almost as far as Lake Ile à la Crosse in Northern Saskatchewan.

The presence of so many big lakes — Great Bear, Great Slave, Athabasca, Winnipeg, Lake of the Woods, Superior, and Huron — strung along the Shield's border, is another key to east-west canoe travel. These lakes all have one side (or end) in granite, and the other in sand or limestone. Nothing bears out better the newer concept of the Shield, not as a divisive wedge, but as a cohesive core to Canada.

The Voyageurs' Highway, however, was a trunk route; and Canadian geography in its bounty has provided more — an extraordinary system of branch routes, grouped around three well-defined hubs. The hubs are *Lakes Superior, Winnipeg, and Athabasca*, each no higher than six or seven hundred feet above sea level. The accompanying diagrams illustrate the cardinal importance of the part that these play.



Working clock-wise around *Lake Superior* from Sault Ste. Marie were the following water connections:

- To Detroit and Niagara via Lakes Huron, and Erie.
- To the Lower Mississippi via Lake Michigan and the Illinois River.
- To the Upper Mississippi via Lake Michigan, Green Bay, the Fox and Wisconsin Rivers.
- To the prairies via the Winnipeg River, using three different approaches: Fond du Lac, and St. Louis River; Grand Portage and the Pigeon River; Fort William and the Kaministikwia River.

To James Bay¹ by two different routes: Lake Nipigon and the Albany River; Michipicoten and Moose River.

To Montreal by two different routes: French and Ottawa Rivers; Lake Simcoe, Toronto, and the St. Lawrence.

Working clock-wise around *Lake Winnipeg* from Winnipeg were the following water connections:

To the Missouri country via the Assiniboine and Souris Rivers;

To the western prairies via the Assiniboine and Qu'Appelle Rivers.

To the Rockies via the Saskatchewan River.

To the Athabasca country via the Saskatchewan River as far as Cumberland House and thence by the Sturgeon-weir, Churchill and Clearwater Rivers.

To Hudson's Bay by two different routes: via the Nelson River; via the Echimamish and Hayes Rivers.

To Lake Superior via the Winnipeg River and one of the three approaches listed above.

To the Mississippi via the Red River.

Working clock-wise around *Lake Athabasca* from Fort Chipewyan were the following water connections:

To the Pacific Ocean via the Peace and Fraser Rivers.

To the Arctic Ocean via the Slave and Mackenzie Rivers.

¹Two other historic canoe routes from James Bay were the route through the River and Lake Abitibi connecting with the Ottawa River at Quinze Lake, and the route, followed by Father Albanel in 1671-72, connecting the Rupert River with Lake St. John via Lake Mistassini.





*Brigade of canoes leaving Lachine.
Painted by Franklin Arbuckle for the Hudson's Bay Company.*

To Hudson's Bay via the Fond du Lac River, Black Lake, and the Dubwant River.

To the Churchill River by two different routes: the Fond du Lac River, and Reindeer Lake; the Athabasca River, and Methye Portage.

To the Pacific Ocean via the Athabasca River, Athabaska Pass, and the Columbia River.

These branch routes were feeders. They should not overshadow the basic east-west

trunk route. And in reviewing the explosive development and exploration of the Canadian North-West during the century following La Vérendrye's penetration into the prairies, the existence of a through way should not be taken for granted. It is of interest to compare the Canadian situation with developments south of the border.

The American *settlement* of the West preceded Canada's, which tends to obscure the fact that Canada felt a steady pulse of east-



A Canot de Maître, or Montreal Canoe, shooting rapids. This oil painting by Mrs. E. M. Hopkins is in the Public Archives of Canada.

A North canoe on the Fraser River. Painted by A. Sheriff Scott for the Hudson's Bay Company.



west commerce thirty years before the Americans had even crossed the Mississippi. What contributed largely to delay American penetration of the far West was the lack of a water through way. The great river of the American plains, the Mississippi, runs north-south. The only American river at all comparable to the Ottawa, the Winnipeg, or the Churchill was the Missouri. The Siberian fur trade also, facing the same odds, had a slower development: the main rivers of Siberia all run north and south, at right angles to the trade-flow.

A search of the map of Canada fails to show any practicable alternative to this main route. There were (sometimes transitory) short-cuts; but, squeezed between the Shield to the north and the United States border, there was simply no other main artery. This canoe route was used for war, trade, or hunting, each section of it by its own group of Indian tribes, centuries before they guided the white man over it.

An interesting postscript is the fact that, with modern engineering advantages, in building first the Canadian Pacific Railway and then the Trans-Canada Highway, we have

VOYAGEURS' HIGHWAY

not departed very far from the basic route. At least from Montreal to Winnipeg, these three routes — one historic, two modern — are braided together, never more than a few miles apart.

* * *

The Voyageurs' Highway was developed by the Montreal fur traders, first the "coureurs de bois". But Montreal's was only one of two vast fur empires that shaped Canada's destiny; and in 1821 the Hudson's Bay Company swallowed its rival, the North West Company, in a merger that retained the older name.

The reason why the Hudson's Bay Company and not the North West Company came out on top was basically geographical and economic. With sea communications from their headquarters in London stretching into the heart of the continent at York Factory, the Hudson's Bay Company could lay down trade goods in the Athabasca Country at half the price of their rivals. The Hudson's Bay Company entrepot was Norway House, at the

north end of Lake Winnipeg. Between there and York Factory lay, not 3000, but only 350 miles, a relatively safe and comfortable route which went from York Factory up the Hayes River and over to the upper Nelson by a curious link, the Echimamish (the river-that-flows-two-ways). From here the goods going up were consigned to, and the furs coming down collected from, either of two main depots, Fort Garry and Cumberland House. The Hudson's Bay Company instead of canoes had York boats, and instead of Canadian voyageurs, Orkneymen. To best their rivals, they imitated them as far as possible, recruited whom they could from defecting Northwesters, and gave their Scots employees bonuses to acquire the voyageurs' skill with paddle and white water.

* * *

A discussion of the waterways of the Canadian fur trade would be incomplete without some review of the later modifications, both achieved and attempted, to the main route described at the outset of this article.

A York boat under sail.

Hudson's Bay Company





Norway House, first built on this site in 1826, as it appears today, a typical Hudson's Bay Company post.

Three abortive attempts were made to cut corners or to by-pass a particularly rough section of the course, respectively by Edward Umfreville, David Thompson and Sir George Simpson. Before the North West Company was ousted from Grand Portage, Edward Umfreville was commissioned in 1784 to try to get through from Lake Superior to the Winnipeg River by way of Lake Nipigon and the English River. The route proved impracticable for heavy trade, and was never used. David Thompson made an attempt in 1796, just before he left the Hudson's Bay Company, to by-pass the rugged Methye Portage and the shallow Methye River by a back-door route into Lake Athabasca from the Churchill near Frog Portage. The route went through Reindeer and Wollaston Lakes and down the Fond du Lac River. Reindeer Lake is 135 miles long and Wollaston, seventy. Lakes that size in that latitude don't break up as early as does a turbulent river such as the Athabasca. In the author's own experience, for instance, Reindeer Lake broke up

in 1957 only on June 20, more than a month after the brigades would have left Fort Chipewyan. Great Bear broke up in 1959 on July 23. Though Thompson does not say explicitly in his journal, this was probably the reason why his attempted route was never used.

A third variation tried (on the Hudson's Bay Company route) was Sir George Simpson's effort in the 1820's to get his Athabasca Brigades to go from York Factory in a direct line west to the Churchill River, by way of the Nelson and Burntwood Rivers. The voyageurs, however, balked at forgoing the fleshpots of Norway House and Cumberland House en route. The Little Emperor's pure logic for one rare occasion had to retreat before human nature, and two sides of a triangle continued to be used.

No alternatives to the main route ever existed in the 600 miles between the heel of Georgian Bay and the Lakehead, nor in the 1000 miles between Rainy Lake and Cumberland House on the Saskatchewan.



A small rapid on the Churchill River just below Stanley. A canoe is coming through at the left.



A canoe being lined up a shallow rapid on the Hayes River. This river was much more suitable than the Nelson for the small boats used in the fur trade.



The Ottawa River at Deux Rivières. A seventy-mile head pond for the Des Joachims hydro dam has drowned out several of the historic rapids and portages along this section.



Left:—Chatterton Falls, near Sturgeon Lake, illustrating the frequent rock falls in this part of the country, along the border lakes west of Lake Superior.

Right:—A dam still standing on the Magline River where the Dawson Trail in 1870 "improved" parts of the old canoe route for the passage of the large bateaux of Col. Garnet Wolseley's expedition.



Shooting Parisien Rapid on the French River. The voyageurs would portage past this only going upstream.



However, two big detours were ultimately developed with a view to easing the voyageurs' back-breaking labours, and to speed the trade by introducing what crude "mechanization" became available. Without noting these and putting date-tags on them, Canada's early trade routes can be confusing. The detours were:

Montreal to Georgian Bay

As canals were developed on the St. Lawrence, Durham boats and bateaux brought the heavier goods from Montreal up the St. Lawrence, through the Bay of Quinte, over the short portage at Carrying Place, to Toronto. In 1797 the North West Company contributed to the cost of building Yonge Street, north to Holland Landing. Boats carried the goods across Lake Simcoe, at first to Barrie, where the Nine-Mile Portage brought them to Willow Creek and thence to Nottawasaga Bay. Then when the Coldwater Road was built a few years later, they went from near Orillia by road to Penetanguishine. Sailing vessels then conveyed them to Sault Ste. Marie. This by-pass via Lake Simcoe operated only between 1797-1821. Some goods from Montreal were even portaged around Niagara Falls and carried by ship via Detroit. This round-about route, however, was used more especially by the American traders in Albany.

Cumberland House to Athabasca River

Following the merger in 1821, Sir George Simpson developed the use of York boats on the Saskatchewan River taking goods the whole distance between Cumberland House and Edmonton, in order to by-pass the strenuous Sturgeon-weir - Churchill route. This necessitated a 90-mile tote-road journey from Fort Edmonton straight north to Athabasca Landing, and a barge trip down the rough Athabasca. In pattern and in purpose this detour exactly paralleled by-passing the Ottawa River and North Bay divide by the Toronto-Lake Simcoe route. Both detours added miles to the route, but saved sweat.²

* * *

There remains only to bring the story of the Voyageurs' Highway up to date, which is

practically to living memory. From 1821, the long, toilsome Voyageurs' Highway between Montreal and Lake Winnipeg was abandoned as a route for heavy trade goods, which thenceforward passed over the Hayes River route between Lake Winnipeg and York Factory. From 1860, by which time American railways had got through to St. Paul, even the Hayes River route was abandoned for heavy traffic, in favour of a progression of varied (rail, Red River cart, and boat) transport via Chicago, St. Paul, and the Red River, to Fort Garry.

People nevertheless still had to move across a roadless nation. Passengers, mail, and "express" between the Athabasca country and Fort Garry, and between Fort Garry and Montreal, continued to use the Voyageurs' Highway. In 1870 Colonel Garnet Wolseley's army had to move west to settle the Riel Rebellion without passing over American soil. For 100 miles immediately west of Lake Superior, they used a modification of the old

Fort William today from Mount McKay looking out on The bend near the lake



²The detour by way of Kaministikwia, Dog, and Savanne Rivers and Lac des Mille Lacs, forced by the compulsory abandonment of Grand Portage in 1803, has been noted earlier.

VOYAGEURS' HIGHWAY

canoe route, the Dawson Trail, which cut a swampy corner off the Kaministikwia-Savanne route by going up the Shebandowan River. An old man of eighty at Fort Frances described to us in 1954 his coming out by canoe as a colonist over this section of the Voyageurs' Highway when he was a boy.

Until the Canadian Pacific Railway was completed in 1885, the Voyageurs' Highway was still the fastest way to cross Canada. An old Indian whom the author talked to on the Methye Portage in 1958 clearly remembered his grandfather telling of the busy wagon traffic over the thirteen-mile trail in the 1880's. Dr. Charles Camsell, who died only recently, in his *Son of The North* tells of coming out to school over this route in 1884.

* * *

This first of a series has intended to stress the waterways of the Canadian fur trade. The main, east-west through way bore an important relationship to the Precambrian

Shield and to the continental drainage pattern — prolific in waterways, wrapped around three hubs, with no intervening barriers.

The basic organization of the Montreal fur trade in its heyday was to have two sets of canoes (each adapted to its own waters) rendezvous half way, swap loads, and return, thus licking the problem of covering a 6000-mile return trip in the five ice-free months. Their original route came to be modified later, as bateaux, York boats, and sailing vessels were used to ease labour.

The trade-pattern of the Hudson's Bay Company, using the sea as an approach to the core of the continent, was short, simple and economically sound. This helped them to swallow their rivals in 1821. That event took the heavy traffic off the route, but the Voyageurs' Highway continued in use for other purposes till only eighty years ago. (*Overcoming obstacles to canoe navigation, such as rapids, watersheds, and big lakes, will be discussed in the July issue.*)

Under Bay. The North West Company fort stood on the left bank of the Kaministikwia River just before its final big bend near





Algiers, the capital, is the largest city in Algeria. The port handles 21 million tons of shipping a year, and the population of the city is over 500,000. The university of Algiers is among the largest of the French Republic, having a student body of about 5,400. There are faculties of law, human

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over 500,000, a high percentage of which are European. The Universities, science, medicine, and a large number of specialized institutes the university.

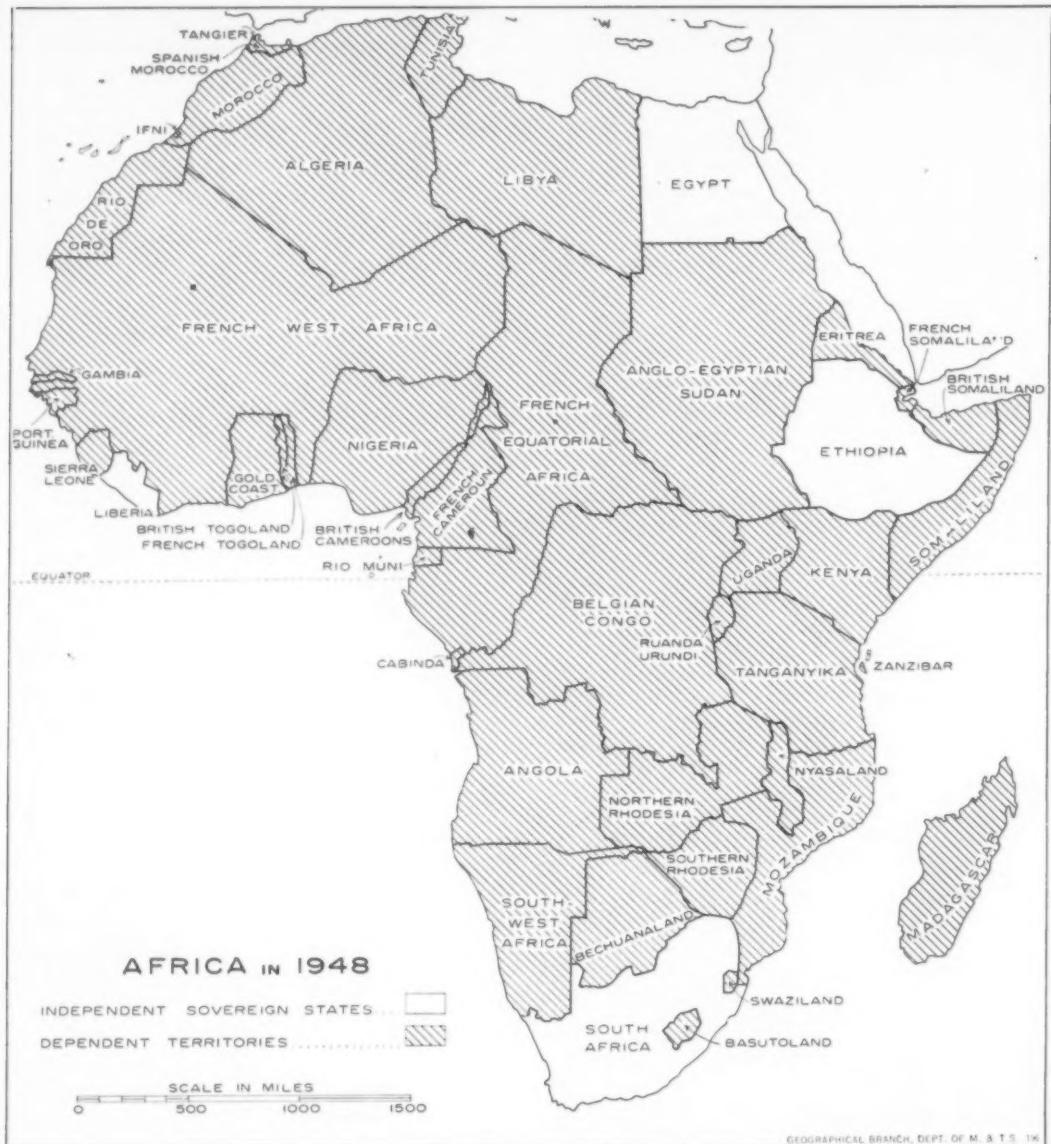
Changing Africa

by BRYAN KEITH-LUCAS

THE MAP of Africa has been changing so rapidly in the last few years, and particularly in the last few months, that a teacher of geography or of political science is practically unable to obtain a map which is completely up-to-date. He has to spend much of his leisure keeping abreast of the most recent developments, and marking them up on his maps. Nor is the process an easy one, because the fluctuations are confusing, and the names are unstable.

For example, there were until January, 1959, two countries on opposite sides of the continent called Sudan (though one was commonly spelt Soudan.) In January, 1959 there was a country called Mali, composed of Senegal, Soudan, Upper Volta and Dahomey; but very soon Mali consisted only of Senegal and Soudan, and in September, 1960, the two parts separated and there was no Mali. Then Soudan assumed for itself the name of Mali. But a few weeks later the new Mali announced its union with Guinea and Ghana (formerly the Gold Coast), though the extent of this union is still uncertain. There is a Republic of Cameroun, as well as the Trust Territories of North and South Cameroons, which have recently had to decide by plebiscite whether to merge themselves into Nigeria or into the Republic of Cameroun. There is a Central African Republic, nearly in the centre of Africa, but there is also a Federation of Central Africa (composed of North and South Rhodesia and Nyasaland) a thousand miles away to the South East. There are the Republic of Niger, and, to its south, the independent country of Nigeria, a member of the Commonwealth. Finally, to add to the confusion, there are two Congos, one formerly French, and one formerly Belgian which may at any moment disintegrate into several separate, or possibly federated, states.

To understand this situation it is necessary to look first at the map of Africa as it was just after the end of the last war. There were then, in 1948, only four independent states in Africa — Ethiopia (or Abyssinia), the oldest of the independent African nations, then re-



cently freed from Italian domination; Egypt, still ruled by King Farouk; Liberia, a small independent state, established in 1822 by American philanthropists to house the returning slaves after the end of the slave trade, and governed by President Tubman, the leader of the dominant True Whig Party; and the Union of South Africa, a full member of the Commonwealth. The rest of the map showed the result of the nineteenth century

"scramble for Africa" by the great European powers, and the boundaries fixed by distant politicians drawing lines on the map at the Conference of Berlin in 1885.

France had, as part of its Overseas Territories, a great bloc in West and central Africa, composed of French West Africa (Mauretania, Senegal, Guinea, Soudan, Ivory Coast, Upper Volta, Niger, and Dahomey) and French Equatorial Africa — Gabon,

French Congo, Ubangui-Chari (now the Central African Republic), and Chad — together with the trust territories of French Togoland and Cameroun (which had been German colonies before the first war). In addition, there were Algeria (part of metropolitan France), Tunisia, French Morocco, French Somaliland, and Madagascar.

Great Britain had its colonies and protectorates of the Gambia, Sierra Leone, the Gold Coast and Nigeria, in West Africa — four separate bites out of the French territories, representing the early settlements along the coast; Uganda and Kenya in East Africa, with the trust territory of Tanganyika, which had once been German; Southern Rhodesia and the Protectorates of Nyasaland and Northern Rhodesia and Bechuanaland in the South East, and the small Protectorate of Somaliland in the north east.

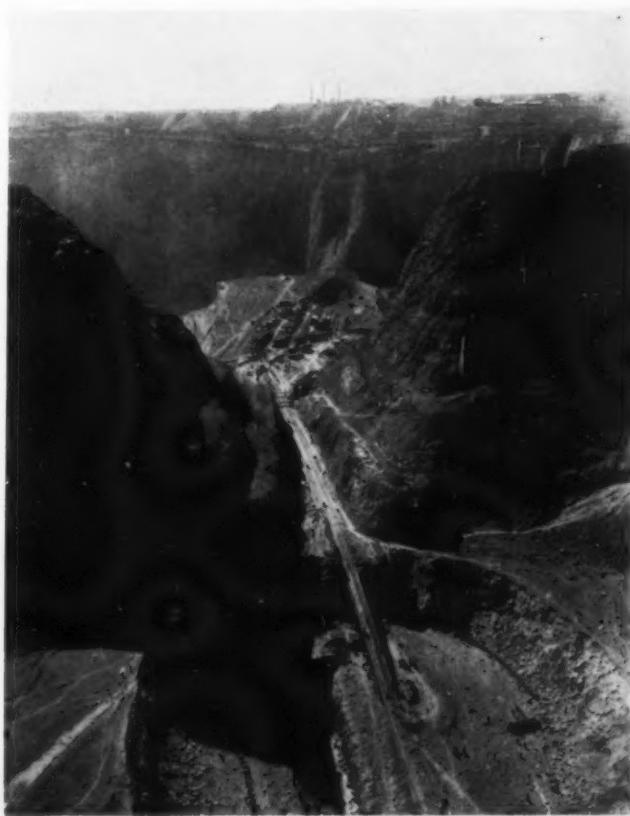
Belgium had the great colony of the Congo, and the small adjoining trust territory of Ruanda-Urundi; Portugal, the three overseas provinces of Angola, Mozambique and Portuguese Guinea, widely distributed over the map; Spain, the small colonies of Spanish Sahara, Spanish Guinea and Ifni in the West and a protectorate over part of Morocco. Italian Somaliland was still under British military rule. The Sudan was administered as a joint responsibility of Great Britain and Egypt. Such was the superficial picture in 1948. But, below the surface, changes were beginning which would quickly produce a revolution without a precedent in history.

Up till that time British policy had in general been based on the policy of Indirect Rule — that is, government through the traditional rulers. It was a system based on the assumption that the Africans wanted to continue to live much as they had lived in the past, while the British guaranteed them peace, good order, and opportunities to trade. France and Belgium, on the other hand, based their administration on the conception of the development of a small, Europeanised or civilised élite, which would achieve the full rights of citizenship. Portugal allowed very little political advance in its territories. None of these conceptions was acceptable to the Africans of the new, postwar world.

A diamond mine near Pretoria, Union of South Africa. There is great diversity of mineral deposits in the African continent, many of which are still undeveloped.

A number of things had been happening during the war which changed the outlook of the more-perceptive Africans. Many of them had travelled abroad, and seen what foreign countries were like. They had served in the army, and learnt their equality with, or even superiority to, white men. They had discussed democracy, and heard the words of the Atlantic Charter, declaring "the right of all peoples to choose the form of government under which they will live." Then they heard of the events in the East; how India and Pakistan, Ceylon and Burma had become independent, and were now to rule themselves. The French and Dutch colonies in the Far East were also winning their freedom. If they could, why could not the African countries?

The main impetus arose out of the growing number of educated Africans, able to read of political progress elsewhere, and to understand the political ideas of Europe and America. The Christian Missions had done much to teach the people to read and write. But the demand for learning grew far beyond the capacity of the schools; the people began to realize that the school was indeed the doorway to progress; that capacity to read and to





A Peuhl woman of the Mali Republic braids a mat. Mali (capital: Bamako) covers an area of 463,500 square miles, and has a population of about 3,700,000. The republic became independent on 20 June 1960.



write mattered above all things. More and more schools were opened, and not only schools, but colleges and universities. At the same time more students found their way to universities abroad. Out of this there developed not only a new professional class of Africans, but also a ferment of ideas.

The people of Africa also began to grow conscious of their own traditions and destiny. Interest quickened in the history of West Africa, and particularly in the great mediaeval kingdoms, such as Ghana and Mali, whose names have now been revived for modern states. Here was evidence that Africans could indeed rule themselves, and did not need European tutelage.

The demand for change did not come from the bulk of the people in their remote villages deep in the bush, nor from the traditional rulers — chiefs and obas, tribal authorities and elders. It came from the new classes; the men who had been educated, perhaps in American or British universities or colleges in Africa; journalists and lawyers, doctors and accountants. Opponents of African nationalism may complain that these men are not typical of the people they claim to represent. It is true; they are not. But the relevant fact is that they are the vocal people; theirs is the voice that was heard, and listened to, and followed. The villagers have accepted them — men like Dr. Nkrumah in Ghana, Dr. Azikiwe in Nigeria, M. Senghor in Senegal.

Generalizations about Africa are easy and tempting, but very dangerous. The differences in peoples and climates, in political problems and attitudes are as wide or wider than those of the different nations of Europe. For instance, political problems are utterly different in Kenya, with its 66,000 European settlers, and in Ghana, where there are practically none; in the copper belt of Northern Rhodesia and among the nomadic cattle raising people of Somalia. So also social conditions are completely different in the primitive parts of Uganda, where clothes are not generally worn, and in the colony of Sierra Leone, where Creole Africans have for a century or more been entering the professions and serving as judges, bishops, and heads of government departments. Nor is it safe to

An artist of the Gaboon Republic works in stone. Gaboon (capital: Libreville) exports petroleum, cocoa, gold, and okoumé wood. There are deposits of manganese, iron, and uranium being brought into production.

generalize about the power and nature of the traditional authorities. In some parts of West Africa the Chiefs are regarded as effete and reactionary — a relic of a discarded system — but in Northern Nigeria they retain their power and their popularity. The Premier of the Northern Region, and leader of the party with a majority in the Federal House, is a magnificent chiefly figure, the Sardauna of Sokoto. The present Kabaka of Buganda, His Highness Mutesa II, was educated at Cambridge University, is an honorary Captain of the Grenadier Guards, and a very sophisticated and able statesman. The contrast between him and some of the minor chiefs of other territories, illiterate and unprogressive, makes it misleading to use one term to denote them both.

Apart from the independence of the Sudan in 1956, the first major moves toward self government came in West Africa; here there was no problem of white settlers, resisting African emancipation, and there was a long tradition of African education and responsibility. African nationalists abroad and in

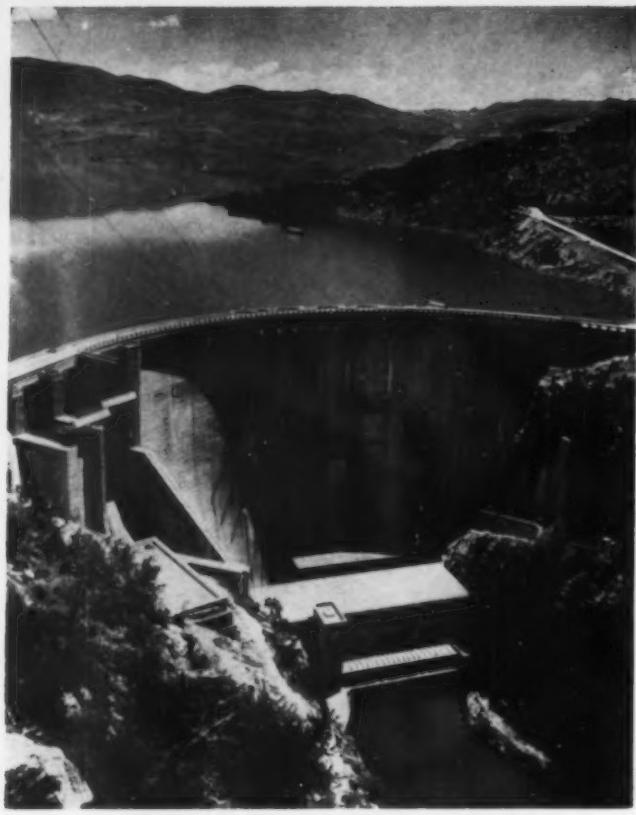
Ghana and Nigeria began to demand the right to rule themselves. The British Colonial Office no longer gave a flat refusal, as it had done to the first tentative demands of this sort before the war. Indeed the Labour Government recognized that some such development was not only inevitable, but desirable. The Colonial Secretary, Creech Jones, directed his energies to the development of democratic local government, so that when responsibility in national affairs was granted, there should be men in the new countries who understood the mysteries of committee work and departmental administration. Steps were taken to promote Africans in the Civil Service, and the Legislative Assemblies of the colonies were enlarged to include elected Africans.

All this was admirable, but, in the eyes of African politicians, much too slow.

It was in the Gold Coast that the challenge came first, for in 1951 there was established a new constitution, in which Africans would for the first time have a majority in the legislature. The leading party fighting the

Villagers carry bundles of piassava for stacking and grading in Potoru village, South Western Province, Sierra Leone. Piassava is a fibrous palm product used to make coarse brushes and brooms. Its production is now a thriving village industry with a considerable export.





Bin el Ouidane Barrage near Beni Mellal in Morocco is representative of many dams being built throughout Africa. Two hydro-electric power stations supply 550 million kilowatt hours of electricity per year. Over 120,000 hectares (about 296,400 acres) of unproductive land have been brought under cultivation since the dam was constructed.



first election was the Convention People's Party or C.P.P., led by the brilliant orator, Dr. Kwame Nkrumah, a graduate of Lincoln University. The vehemence with which he demanded independence and self government resulted in his being imprisoned for sedition. None-the-less, when the election came, his party won a sweeping victory.

This was perhaps the most critical moment in modern West African history. The Governor, Sir Charles Arden Clarke, took the course of faith and hope. He released Nkrumah from prison, so that he might accept office as Leader of Government Business, or Prime Minister. So began the African rule of Ghana, which led to its independence in 1957, and its declaration as a republic within the Commonwealth in 1960. Had Arden Clarke not had the courage to release Kwame Nkrumah from James Fort prison on the 12th February, 1951, the history of Africa might well be very different.

Similar demands for independence, or at least self-government, were being made in other parts of Africa, particularly in Nigeria and the French territories of West and Equatorial Africa. France was, step by step, abandoning her old conception of assimilation — of trying to civilize Africans on the French model — and was granting more and more control and responsibility to the local people. Elected assemblies were created, and representatives were sent to the French Parliament in Paris. But it was not until de Gaulle came to power, and the constitution of the Fifth Republic was proclaimed, that independence became a possibility. Under this constitution the African territories are free to adopt complete autonomy within the French Community; and membership of the Community no more implies control by France than does membership of the Commonwealth imply control by Britain. In 1959 Guinea chose to have independence outside the Community, but the remaining states — Malagasy (formerly Madagascar), Soudan, Upper Volta, Ivory Coast, Chad, Niger, Senegal, Dahomey, the Central African Republic, Congo, Mauritania and Gaboon remained within it. But they are none-the-less independent nations, each with its separate membership of the United Nations (except Mauritania, which has not yet been admitted

Logs of hardwood at the edge of a lagoon near Dabou, Ivory Coast. Coffee, cocoa, and wood (chiefly mahogany and iroko) are the main exports. The Ivory Coast (capital: Abidjan) became independent on 7 August 1960.



Cargo ships from Great Britain being unloaded in Kilindini harbour at Mombasa, Kenya. This port has become increasingly important during the past fifty years, and the facilities are being expanded.

because of the opposition of the Soviet bloc).

In this separateness lies one of the greatest problems — perhaps one of the tragedies — of Africa. There are now in West and Central Africa more than a dozen independent nations. Apart from Nigeria, none of them has a population of as much as five million; some of them under half a million. These nations have out of their limited resources of educated men and money to support more than a dozen parliaments and civil services, armies, and delegations at United Nations. Moreover they are split by tradition and language between those which have grown up under British, and those formerly under French, rule (as well as small pockets of Spanish and Portuguese government). And yet their boundaries are all artificial and arbitrary, following neither the tribal limits, nor the ethnic groups. They have no basis in the ancient loyalties of their peoples.

Nkrumah has long been a champion of

Pan-Africanism, of the creation of one African nation and a critic of this "balkanization" of West Africa. Indeed the Ghana constitution declares the nation's intention to merge itself into such a greater whole. There is now a nominal union with Guinea and Mali (Soudan), but it is doubtful whether this will ever become the nucleus of a true West African state. Yet there can be no doubt that, were such a union or federation possible, all might benefit from it. The present division into many small nations is to no one's advantage.

Ghana had achieved its independence in 1957, and Nigeria three years later, after some delays due to the complications of its federal structure, and the caution of the rulers of the North. There then remained two British territories in West Africa, Sierra Leone and the Gambia. It had generally been assumed that some solution other than complete independence and full membership of the Com-

monwealth must be found for these smaller colonies; Sierra Leone has two and a quarter million people, the Gambia only one quarter of a million. But now Sierra Leone has been granted its independence (27th April, 1961), and there remains only the Gambia. It is difficult to see what its future should be — perhaps union with Sierra Leone, or with Senegal which lies all around it.

In all the countries of West Africa independence has been achieved in a remarkable spirit of good will. There have been very few political riots and no rebellions; the final handover has been achieved in an atmosphere of mutual congratulation more reminiscent of graduation day in a Canadian college than of the Battle of Yorktown. The transfer of power has been made much easier by the fact that the population of these countries is almost entirely African. Though there are great differences between the various tribal groups, there are practically no Europeans permanently established there. West Africa used to be known as the White Man's Grave, on account of the climate and the prevalence of malaria. It is only in the last twenty years that medical science has made it possible for

European families to live there, and there has not grown up any substantial group of permanent settlers from outside Africa.

In East and Central Africa however the position is very different. The climate there is much more attractive, and malaria is less of a danger. So, encouraged by the British Government, hundreds of thousands of Englishmen and Scotsmen have settled in Kenya and the Rhodesias; they and their children have made their homes there, and devoted their lives, their skill and their capital to developing and improving the land, its agriculture, trade and industry. In much the same way great numbers of people have come from India and Pakistan, attracted greatly by the opportunities of trade. As a result of these immigrations Britain has in the East a far more intractable problem than anything she has met in the West. Each group has its own interests to be defended, and relations have not been so easy, nor tempers so well kept.

Politically the dominant group has been the European settlers. Encouraged by former British governments, they claim the right to at least the same degree of self government as other, less developed territories. Their attitude in general to the African is paternal and patronising. They want to help him to become educated and civilized; then, when he has achieved civilization and understanding, they are prepared to allow him his share of political responsibility. But, with the shadow of Mau Mau and the Congo in the background, they are not prepared to risk all that they have achieved in the country for the sake of what they regard as a dogmatic fallacy — the political equality of all men, irrespective of their state of civilization.

To the African of these countries the picture looks very different. He is the native owner of the land, and yet the settlers now occupy nearly all the most fertile areas and exclude him from political power, from economic opportunity and social equality. He claims the same right as his brothers have elsewhere in Africa — the right to govern his own country.

Kenya is still a British Colony, and the British Government is insisting on a rate of political development which the bulk of the settlers regard as dangerous and possibly



Mount Lengai (9,500 feet), by Lake Natron, Tanzania, is East Africa's most active volcano. This Royal Air Force Twin Pioneer aircraft, locating the source of a sulphur odour reported in the vicinity in 1960, flew over the crater as a giant bubble of lava burst.



disastrous. But they are a small minority of the whole population, and the Mau Mau revolt showed that the Africans are not prepared to continue as second class citizens in their own country. Elections have recently been held for a new Legislative Council with an African majority. There is no doubt that serious risks are involved in this development; but any other policy would involve yet greater risks, and could offer but little hope of an ultimate peaceful solution.

The problem is even more difficult in the Federation of Nyasaland and the Rhodesias. Two of the territories — Nyasaland and Northern Rhodesia — are under Colonial Office rule. There the British Government can pursue its policy of constitutional development; already Nyasaland has a legislature in which the Africans have a majority; Northern Rhodesia will probably soon be in the same position. Southern Rhodesia is virtually self governing, and does not come



A group of Girl Guides at a camp held in the grounds of Government House, in Nairobi, Kenya. They represent the four races present: African, Arab, Asian, and European. The Boy Scouts were started in Kenya in 1918, and the Girl Guides in 1920. These two movements have proved adaptable to the needs of different races and to the changing demands of the times.

under the Colonial Office. But its self government is government by the 220,000 white settlers, who constitute but 7% of the total population. This fraction of the population occupies over half the land of Southern Rhodesia, and all the seats in the Legislature. It controls the industry and the commerce of the country, and maintains a social life in which the Africans have no place. At the same time African education has been rapidly advanced; a multi-racial university has been opened in Salisbury, and expenditure on schools and health services has risen rapidly. These, the settlers claim, are the fruits of their policy of "partnership" between the races. But to the Africans such benefits are irrelevant so long as the country is ruled by aliens.

Economically these three countries could scarcely stand alone; politically they can scarcely live together, so long as Southern Rhodesia pursues its present racial policy. The people of Northern Rhodesia and Nyasaland will not agree to remain in a Federation

which is dominated by the Southern Rhodesian settlers and their racial policies. The settlers of the South are not prepared at present either to change their policies or to continue in a Federation in which two out of the three parts are to be governed by legislatures in which the Africans predominate. In the long run, or perhaps quite soon, the final decision will have to be made; and it will not be made by Sir Roy Welensky and his settler colleagues, but by the Africans; not by the few educated Africans to whom Welensky is prepared to grant political rights, but by the mass of the ordinary people, who will decide whether the settlers are to be tolerated in the country at all. Mrs. Partington, defying the Atlantic with her broom, or the Duke of Wellington, resisting parliamentary reform, was in a far stronger position than the settlers will be in then.

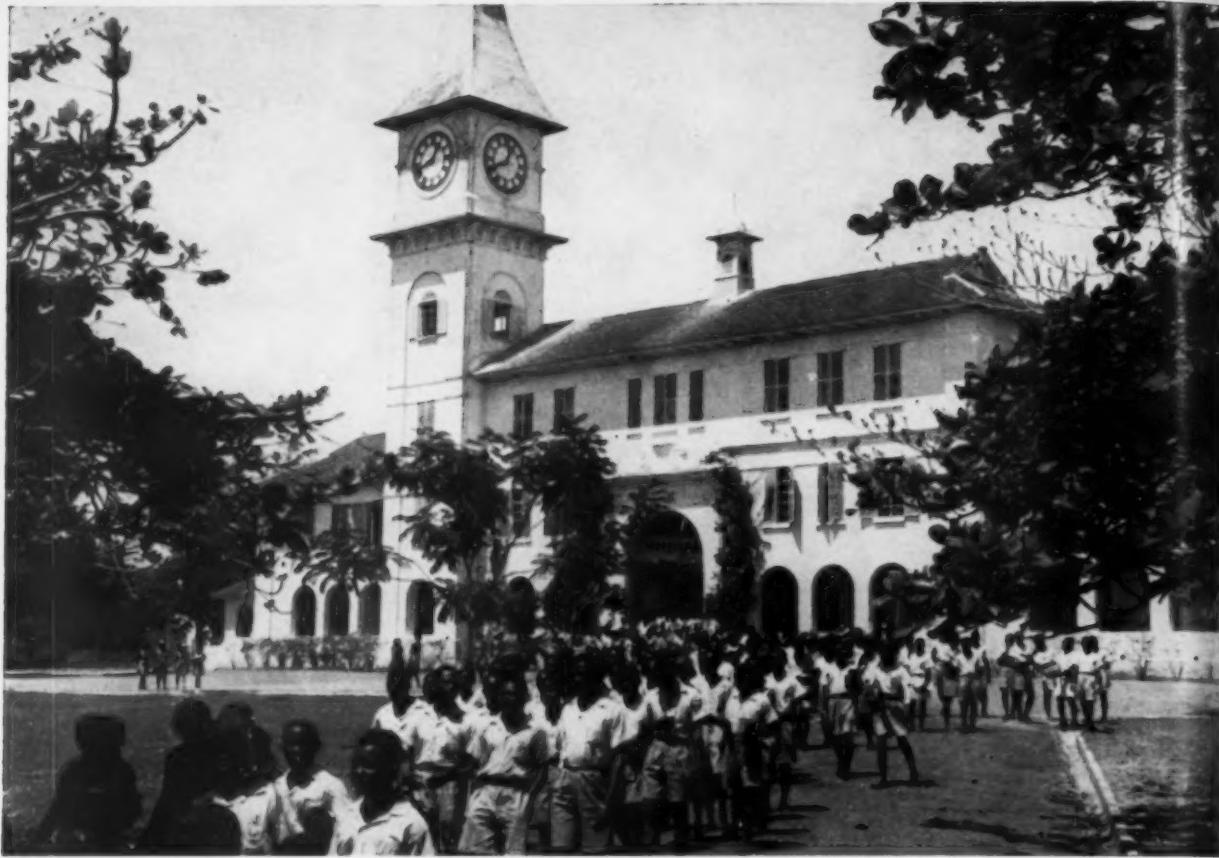
In strange contrast to these countries is Uganda, a British Protectorate, where constitutional progress is being opposed not by white settlers but by Africans. A large part



Most colonial governments have striven to provide adequate medical care for the people of the colonies and protectorates and to train African medical staffs. A young patient looks a little suspiciously at the Resident Medical Officer of the Connaught Hospital, Freetown, Sierra Leone.

A busy village market near Brazzaville in the Congo Republic (formerly the French Congo). Brazzaville is an important education centre for Chad, Gaboon, and the Central African Republic as well as the Congo.





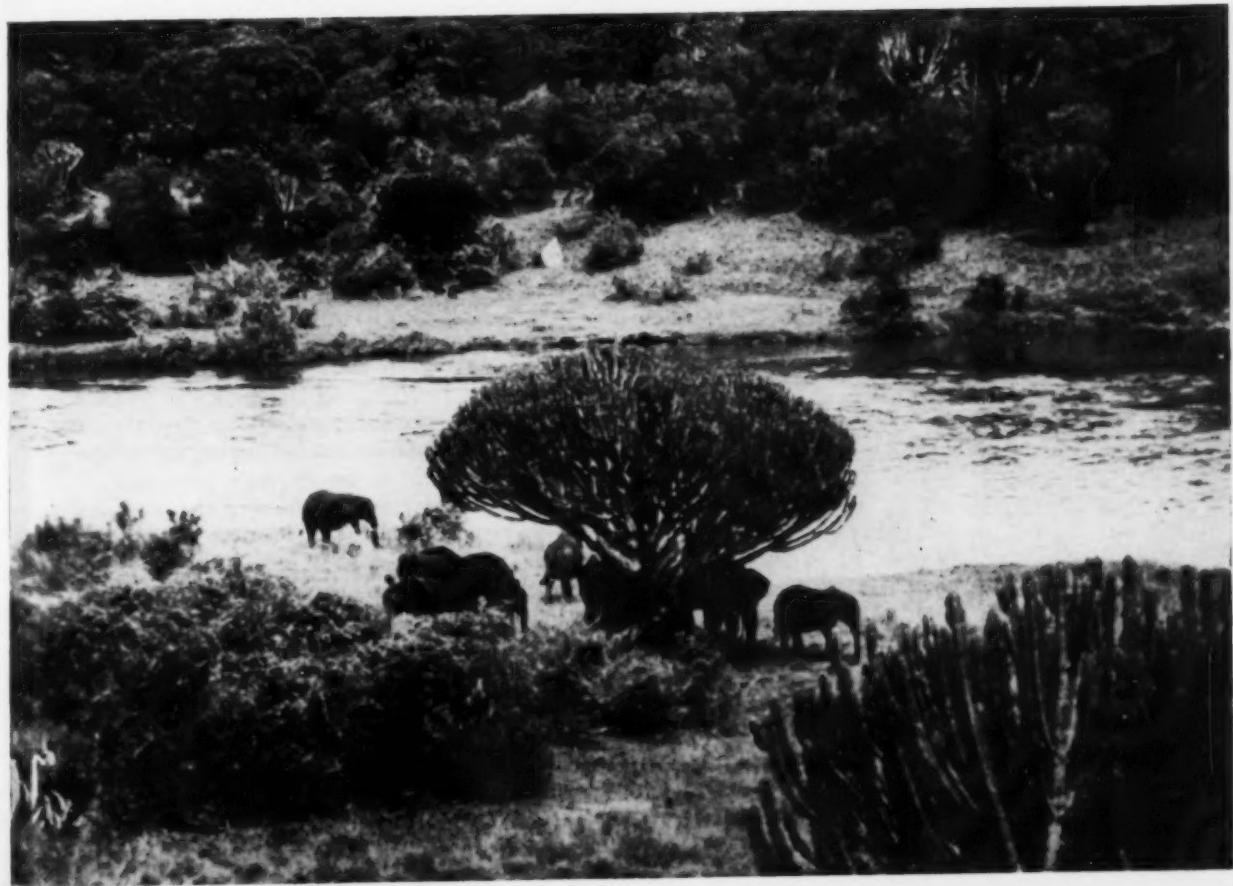
Typical perhaps of many colleges founded to give Africans secondary education is Achimota College, near Accra, Ghana.



Right: This herd of elephants in the Congo (formerly the Belgian Congo) jungle were photographed at their watering place from a low-flying helicopter.

Left: A fine newly-built cathedral at Conakry, the capital of the Republic of Guinea.

Upper right: Mountains near Ihosy in Fianarantsoa Province, Malagasy Republic. In the foreground is the main road going from the north to the south in the island. Agriculture is very diversified as a result of great differences between the regions in soil, climate, and topography. Coffee, rice, vanilla, sugar and tobacco are the most important sources of income through export.



of the country, and much the richest part, is the Kingdom of Buganda, ruled by His Highness the Kabaka, Mutesa II. He claims, and his people support his claim, that Buganda is a separate nation, formerly under treaty relations with the British Crown, but now, since the Parliament (or Great Lukiko) denounced the treaty on 31st December, 1960, quite independent. For some years the British Government has been trying to lead Uganda on to be a united country, governed by an elected and responsible parliament. For this purpose it sent there as Governor in 1952 Sir Andrew Cohen, a man of liberal opinions, boundless energy, and with a real faith in the policy of letting the Africans rule themselves. He tried to introduce democratic government, but the Kabaka would have none of it, for it meant the absorption of Buganda into the new, united, state. Despite all his enthusiasm and faith, Sir Andrew failed, and he found himself forced to play the autocrat, sending the Kabaka into temporary exile. Now another attempt is being made to introduce an elected African Parliament with universal adult franchise. But the people of Buganda (the Baganda) are boy-

cotting the election; they refuse to accept the implication that their country is no more than a part of the Protectorate. On the other hand the British Government and the courts deny the Buganda interpretation of the treaty. It is argued that only as one nation can Uganda hope to progress to self government and ultimate independence. This is probably true, but, in the eyes of the Baganda, irrelevant.

These however are perhaps minor problems when compared with other parts of Africa. In South Africa, in the Portuguese colonies of Angola and Mozambique and in Algeria, the same basic question arises — how long will the Africans tolerate white domination? However benevolent the Europeans may be, however much they may bring the benefits of education, medicine and industry, the Africans are no longer willing to accept this alien rule. It may be that at present the Afrikaners in South Africa or the Portuguese in Angola have the power to retain their position, but inevitably it is precarious, because they are comparatively few. The slower they are to recognize the rights of the Africans, the more repressive their rule, the greater will be the resentment and anger of the Africans. The white men may be able to postpone the final challenge for some years by force of arms or police methods; economic concessions and social improvements may soften the resentment and postpone the challenge, but to the African they can never be substitutes for the right to govern themselves — for liberty.

Yet one can not ignore the other side of the picture; the danger of granting independence to people before they are qualified to use it. The Congo is an awful warning of the risk involved. But the risk might have been even greater, had the Belgians refused the demands for independence in 1960.

The map of Africa has not ceased to change. The process will go on, until the present conflicts are resolved. The claim of the Africans to govern themselves is inevitable and reasonable. The problem that faces Great Britain and the other members of the Commonwealth is how best to help the new nations first in establishing and then in using their independence. The question is now what sort of nations these will be; whether they will be



A solitary silk-cotton tree towers above other trees along a road in Liberia.

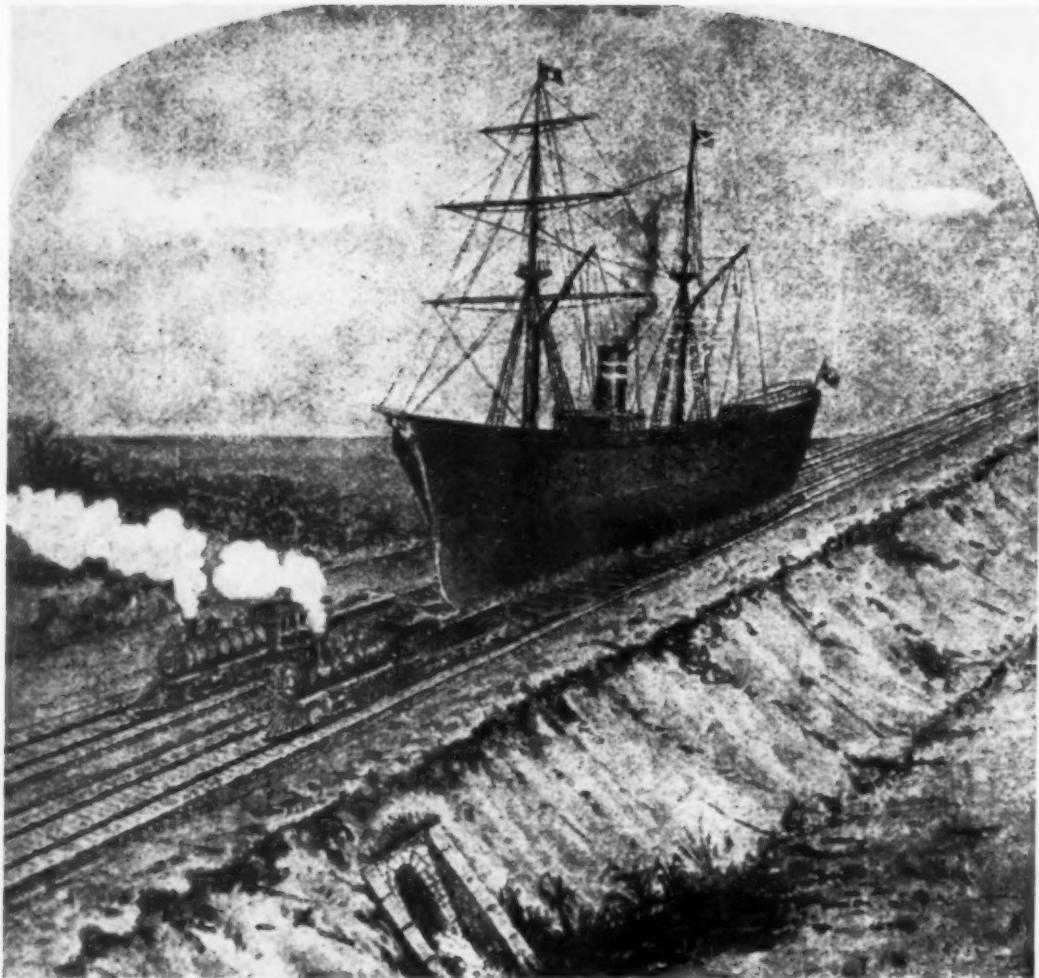


In Uganda, the conservation of soil and water is a paramount problem. African farmers are being taught the importance in hillside cultivation of terracing the ground correctly and of crop rotation. In addition to providing for his own needs, the farmer is encouraged to grow cash crops of cotton, coffee, and tobacco. The area shown here is at Kigezi, looking toward the volcano, Mahavura (left), and others which demarcate the border with the Congo Republic.

able to make democracy a reality, and to develop their economic resources. The help that England can give is limited by the fact that she has been the colonial power. The United States is in some ways suspect because of her political concern over the alignment of nations in the cold war, and also because of her own racial difficulties in the South.

Canada, however, can play a very important part in helping the new African nations to establish themselves. In technical advice, in university education, and in political understanding this country has a great opportunity to help in what is perhaps the most exciting and the most significant development of the post war years.

Grateful acknowledgement is made to the following sources for photographs used to illustrate this article: United Kingdom Information Office, Embassy of France, South African Railways and Harbours, Canadian Pratt and Whitney Aircraft Company, Richard Harrington.



An artist's impression of a ship in transit across the Chignecto Isthmus.

The Chignecto Ship Railway

by STANLEY T. SPICER

Photographs from the Ketchum Collection, Bonar Law-Bennett Library, University of New Brunswick.

RECENTLY, interest has again been developing in the possibility of a canal across the Isthmus of Chignecto. Sparked particularly by the individuals and organizations concerned with the economy of the region, preliminary indications are that some form of serious study of the project will be undertaken in the near future.

Through the years the Isthmus of Chignecto, that narrow strip of land which joins

Nova Scotia to the rest of Canada, has been a source of controversy. It is this Isthmus which forces vessels plying between the Gulf of St. Lawrence and ports along the Eastern seaboard and the Bay of Fundy to take the long and often dangerous route along the Atlantic Coast of Nova Scotia. The concern for a canal or similar device to overcome this problem is not new. An excerpt from the *Moncton Daily Transcript* reads:

THE CHIGNECTO SHIP RAILWAY

"A very slight knowledge of the volume and direction of marine traffic between the Gulf and Bay of Fundy and the Atlantic and a glance at the map would convince any person of the desirability of some means of transporting vessels and their cargoes across the Isthmus of Chignecto."

This statement was written more than seventy years ago just before construction started on the Chignecto Ship Railway. Begun in 1888 and almost completed before it was abandoned in 1891, the railway was one of the most remarkable engineering projects of its time. Now, a grass-covered ditch near the New Brunswick-Nova Scotia border marks one of its few visible remains.

In the beginning the ship railway was the vision of one man, a man who planned it, fought for it and who contributed much of the engineering genius during its period of construction. Henry George Clopper Ketchum was born in 1839 in Woodstock, New Brunswick. He was educated in Fredericton and received the first diploma in Civil Engineering granted by Kings College University, later the University of New Brunswick. Ketchum was, for a number of years, one of the engineers on the São Paulo Railway in Brazil. In 1865 he returned to New Brunswick and became resident engineer on the construction of the railway between Moncton, New Brunswick and Amherst, Nova Scotia. Later he was chief engineer on the construction of the New Brunswick Railway between Fredericton and Edmundston. This background in railroad construction would serve him well in the 1870's when he turned his attention toward the possibility of a ship railway across the Chignecto Isthmus. In this he would associate himself with some of the great engineers of the nineteenth century.

The proposal for a passage for ships across the Isthmus was not new, even in Ketchum's time. In the years between 1686 and 1875 at least eighteen surveys, studies and reports had been undertaken. In some instances funds had actually been raised and companies formed but for various reasons construction had never actually begun. There was, however, one significant difference between Ketchum's plan and all earlier proposals. These had been concerned with a canal while Ketchum's plan was based on a ship railway.

It created widespread, immediate interest.

A passage for ships across the Isthmus of Chignecto would have a profound effect on the maritime economy of the region. It was estimated that such a passage would save vessels some five hundred miles on voyages from the St. Lawrence to Saint John, New Brunswick via the Canso Straits while saving at least three hundred miles for vessels bound for Portland, Boston and other Atlantic ports. In addition such a passage would provide a saving on insurance premiums which were relatively high for vessels sailing the Atlantic coast of Nova Scotia. Then, too, inland vessels could use the railway although their construction precluded use of the longer Atlantic passage. This, it was forecast, would encourage a large trade between the western lake ports and New England ports.

Ketchum proposed a ship railway, rather than a canal, for a number of reasons. The cost of a canal in the mid 1870's was estimated at between five and one-half and eight million dollars where a railway would be considerably cheaper to construct. As a point of comparison, it is interesting to note that present-day estimates place the cost of a canal at between eighty and one hundred million dollars. Ketchum also proved that the railway could accommodate the paddle-wheel steamers then plying the Gulf of St. Lawrence and the Bay of Fundy — something that the proposed canal would not permit. He felt that the tidal differences between the Bay of Fundy and the Gulf would be a far easier problem to overcome by a railway than by a canal. Finally, he was convinced that the maintenance and operating costs of a railway would be far less than for a canal and that it would be feasible as a private venture.

While considerable support was indicated for the ship railway, one major question to be resolved was whether or not vessels' hulls would be damaged when raised, fully loaded, out of the water. A number of captains had definite reservations on this point and were quite vocal about it. However, the principle of a ship railway was not unique. Lifting docks in London, Malta, Bombay and San Francisco had been used successfully for many years to lift loaded vessels out of the water for repair purposes. Dry dock companies in many parts of the world moved ves-

sels by rail for varying distances. The important factor was that the vessels must be lifted smoothly, without vibration and that the hulls must be properly supported and blocked when out of the water.

Nearly seventy years later it is interesting to note the plans for the railway as proposed by Ketchum. The ship railway was to be seventeen miles in length, running from Tidnish on the Gulf side to Fort Lawrence on the Bay of Fundy side. It was a double rail line and almost without gradient. The dock at the Bay of Fundy end was a spacious basin five hundred feet long, three hundred feet wide and forty feet deep. It was walled in with heavy masonry and at one end a gate sixty feet wide and thirty feet high opened to admit shipping at high water. The dock was sufficiently large to accommodate six ships of an average of one thousand tons each.

At the Tidnish end, due to the small tides involved, there was no excavated dock. Instead, a dock would be built out into Baie Verte and for this purpose a channel was dredged for some three thousand feet.

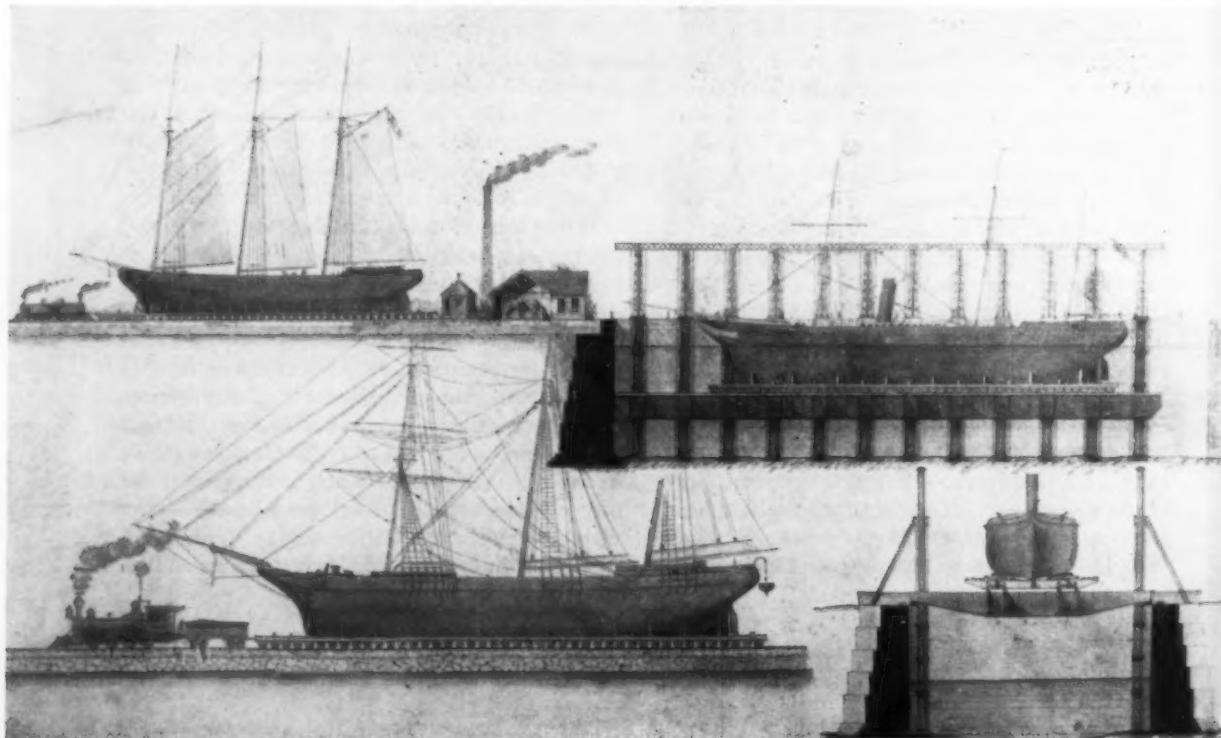
The vessel to be transported was floated over a gridiron which, with a cradle on it, was immersed at the bottom of the dock. The

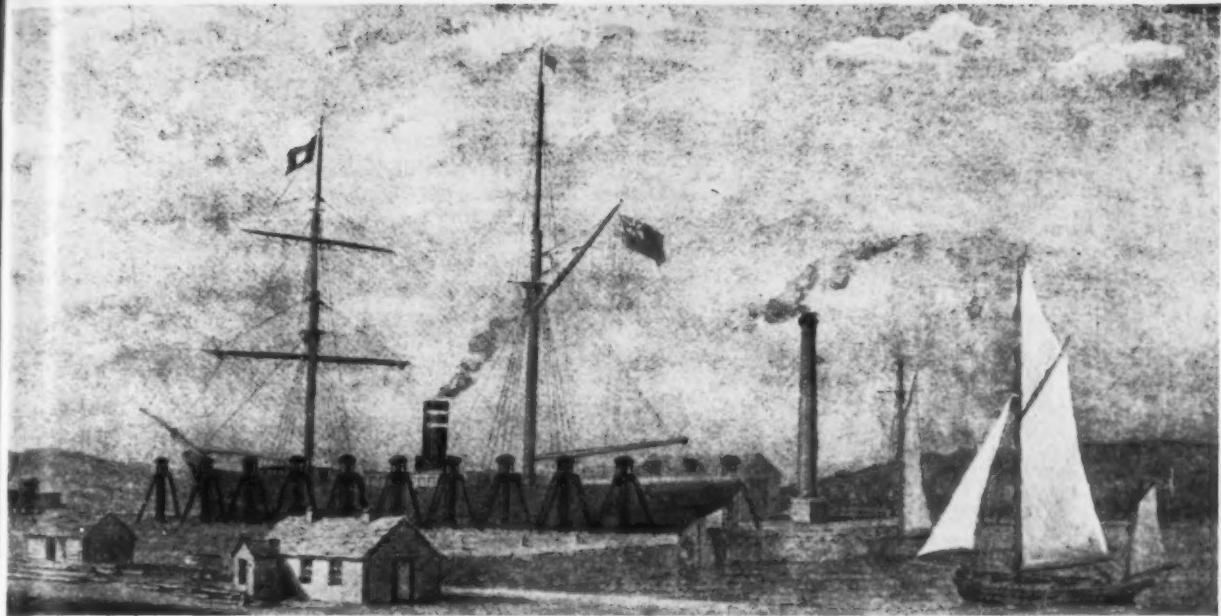
cradle was two hundred and thirty feet long, forty feet wide and was carried on one hundred and ninety-two wheels. When the vessel was in position and properly secured the cradle would be lifted hydraulically and the gridiron locked to the sides of the quay. Hydraulic machinery would haul the cradle and vessel on to the track where two locomotives would take over and tow the load across the Isthmus at a speed of from five to ten miles an hour.

When the vessel arrived at the end of its overland journey, the two locomotives would pass on to a siding. Hydraulic machinery would pull the vessel over another gridiron which would be slowly immersed until the vessel once again floated in water. The cradle would be raised, passed on to a siding and the line would be clear for a succeeding vessel. The railway was designed to take vessels up to two thousand tons dead weight or up to one thousand tons gross register laden.

Commerce statistics of the period indicated that a heavy volume of shipping could be expected to utilize the facilities of the railway. The official *Report on Trade and Navigation* for the year ending June 30th, 1890 shows that nearly seventy-one thousand

H. G. C. Ketchum's original sketch plans submitted to the Canadian Government in 1882, showing the principal of the gridiron upon which a vessel would be floated, raised to track level, and towed across the isthmus by locomotive power.





An artist's impression of a ship being raised in the lift.

vessels, totalling more than eleven and a half million tons, entered and departed ports along the Gulf of St. Lawrence, Prince Edward Island and the Bay of Fundy. It also indicated that the annual rate of increase over the past several years prior to 1890 had averaged close to five hundred thousand tons. If only seven percent of the tonnage of the region used the railway at a fee averaging fifty cents per ton on freight and twelve and one-half cents per ton on vessels' hulls, an annual income of about \$500,000 could be realized. Thus the railway did have definite economic possibilities.

During the navigation season it was anticipated that one lift could be made every hour for eight hours on each tide. The plans called for the railway to be used throughout the year despite ice problems in the Gulf. It was planned that the Bay of Fundy dock could be used for loading and discharging vessels, being ice-free, while the Tidnish dock could be occupied with the building and repairing of vessels.

In 1881 Ketchum carried out, at his own expense, a survey for the ship railway and submitted a plan to the Hon. Sir Charles Tupper who, at the time, was Minister of Railways and Canals in Ottawa. In his plan Ketchum proposed to form a company which would build the canal, provided that the government would pay an annual subsidy.

In 1882 the Chignecto Marine Transport Company was incorporated and in the same year the Government of Canada voted an annual subsidy of \$150,000 payable for twenty-five years. Plans for the railway continued and, in 1886, at the request of the company, the subsidy was increased to \$170,602 but the term was reduced to twenty years. The company then entered into a contract with a British firm for construction capital and a total of six hundred and fifty thousand pounds was raised by this company in its initial stages.

Land for the project was presented as a gift by the County of Cumberland in Nova Scotia. Construction of the ship railway began in the fall of 1888 and continued until the summer of 1891. During that period many difficulties were encountered. The heaviest rails ever used by a railway had to be rolled, bogs along the line had to be dug out and re-filled, and the hydraulic lifts to be used at each end presented new and challenging problems. Yet these and a multitude of other obstacles were met and overcome. When work was halted in July, 1891 about three-quarters of the job had been completed. Most of the machinery had been manufactured and delivered, twelve miles of track had been laid and most of the balance was ready. The cradles and locomotives were almost ready for delivery. It was estimated that one sum-



The original road-bed with some of the rail line laid.



One of the bogs encountered which had to be dug out and rock-filled.



Remnants of the dock built at Tidnish.



Workmen excavating the site of the railway.

mer's work and \$1,500,000 was needed to finish the railway. However, it became impossible to raise these necessary funds, apparently because of a depression at the time and changes in government.

The Chignecto Ship Railway was one of the great pioneering projects of its time and what precedents it might have established are now only a matter for conjecture. Ketchum was certain that similar railways would follow at such points as Cape Cod, the Ontario and Michigan isthmuses and as a means of linking a number of lakes in central and western Canada. Sir Benjamin Baker, a world renowned engineer of the time from England, who was directly associated in the work on the ship railway and who was involved in the building of the London and New York subways said, "A ship railway is the logical result of the continual improvements in railroad methods from the time of the first railroad to the present. If it is possible to raise vessels and transport them overland with safety and economy why should they be compelled to make great detours costing time and money."

It was a dream which remained unfulfilled. Today few remnants of the railway remain. The brick used in the construction of the power house now forms part of the fire wall in the Fort Beauséjour Museum located near the site. The heavy rock used in the railway construction was moved to Cape Tormentine, New Brunswick and Borden, Prince Edward Island for the ferry approaches. In 1902 the Dominion Government purchased the rails and fastenings for use on the Intercolonial Railway. Thus gradually the Chignecto Ship Railway disappeared.

Ketchum died in 1896 at the age of fifty-seven and was, at his own request, buried at Tidnish near the site of his ship railway. His most fitting epitaph, perhaps, came from himself when, in a letter to Sir Benjamin Baker, he wrote:

There is a time, we know not where,
A point we know not when,
That marks the destiny of men
To Glory or Despair.



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EDITOR'S NOTE-BOOK

Professor William L. Mayo of Ann Arbor, Michigan, is shown for the first time this month on the Contents Page of the Journal as a Special Representative of the Society in the U.S.A. Although Professor Mayo is shown at his permanent home address, he is at present Assistant Professor of Education at Mercer University, Macon, Georgia. His duties will include both membership extension and advertising representation.

* * *

Eric W. Morse (*Voyageurs' Highway*) is by training an historian, by profession an association executive, and by summer holiday avocation a modern day voyageur.

He took his M.A. in history at Queens University, and did post graduate work at the School of International Studies in Geneva. Following demobilization from the R.C.A.F. in 1945, he became National Secretary of the United Nations Association in Canada, and was appointed in 1949 to his present position as National Director of Canadian Clubs.

Mr. Morse has made a special project during summer holidays of retracing the old explorers' and fur traders' routes across Canada by canoe. Guided by maps, air photos, and early explorers' journals, he has covered some 3,000 miles of the old routes in this way. During many of these summer expeditions, Mr. Morse has been a member of a small group of Canadians and Americans who call themselves the Voyageurs, and whose aim is to travel the historic canoe routes of the early voyageurs, a four or five-hundred mile segment being selected for travel by canoe during a three-weeks holiday period in the summer.

* * *

Bryan Keith-Lucas (*Changing Africa*) is a Fellow of Nuffield College, Oxford, and has been visiting Professor of Political Science at Carleton University, Ottawa, in the academic year 1960-61. He was Chairman of the Electoral Reform Commission in Sierra Leone in 1954, and of the Commission on Local Government Elections in Mauritius in 1956. In 1960 he was in Kenya and Uganda studying local government.

Stanley T. Spicer (*The Chignecto Ship Railway*) is a native of Kentville, Nova Scotia, and is a graduate of the University of New Brunswick, of Acadia University in Wolfville, Nova Scotia, and of Springfield College in Springfield, Massachusetts. Since 1947 he has been Director of the Adult Education and Fitness Branch of the New Brunswick Department of Education. Mr. Spicer has written a number of articles, chiefly on yachting and marine history, for *Motor Boating*, *Atlantic Advocate*, and *Canadian Homes and Gardens*. He has also prepared numerous scripts for the Canadian Broadcasting Corporation on historical topics.

* * *

AMONGST THE NEW BOOKS

The Road to Andorra

by Shirley Deane

(The Macmillan Company of Canada. 186 pp. \$3.75)

When the authoress of this book tells us that she and her family was expelled from Spain at three days notice on account of an American review of one of her previous books, any reviewer naturally approaches the task of commenting on the present delightful publication with considerable diffidence; also one is bound to admire the intrepidity of a writer who in spite of such an experience still continues to cast bread upon the waters of the literary world. It would be a churlish reader indeed who did not welcome such a refreshing book as *The Road to Andorra*. The joyous enthusiasm of the authoress seems to carry the reader right along with her not only to a remote spot of land but also to a remote time-factor where atom bombs and world problems are not.

Mrs. Deane has written other delightful books about distant corners of Spain and Italy, and this time she transports us to that remarkable dot on the map known as Andorra, a little independent speck of territory on the southern slopes of the eastern Pyrenees which was constituted as a state by Charlemagne, and whose people are well content to let things stay that way. It has its own council of twenty-four senior Andorrans and there is some remote control both by France and Spain, but nobody seems to mind very much about anything except the problem of maintaining life in the villages that cling precariously to those bold, steep mountain sides which serve to shut out the alarms of international war. An ava-

lanche would be a much more personal concern. When the *douanier* commented on the peculiarity of such occupations as artist, for Mr. Deane and writer for Mrs. Deane, she blandly agreed with him, but the villagers took the couple to their hearts. They and their two children fitted perfectly into the harsh mountain life and flourished on a diet of mushrooms, snails, blackberries and squirrels until they were lured into the prospect of making money on a pig farm in Ibiza, third largest of the Balearic Islands. Actually the pigs never materialized and it was while waiting for them that the order for their expulsion from Spanish territory fell on them like a thunderclap. Hastily they fled back to Andorra where they received a warm welcome, but journeyed on to Paris when all remonstrance with the authorities proved vain.

This happy picture of unconventional life and adventure flows easily

from Mrs. Deane's sparkling pen, and one is filled with admiration for a mentality so versatile that she can find such joy in the unsophisticated paths of her own choosing, and describe it for us with such light-hearted skill.

SYLVIA SEELEY

* * *

Marine Infaunal Benthos in Arctic North America

by Derek V. Ellis

(Arctic Institute of North America, Technical Paper No. 5, 51 pp., paper bound, English with Russian Summary).

This paper represents one of the first attempts in the Canadian Arctic and West Greenland regions to measure the standing crop of marine infaunal animals, that is to say those invertebrates living on or in the soft bottom sediments. The standing crop, expressed as the amount of incinerated animal tissue per unit area of sea bot-

(Continued on page VI)

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ton, gives a measure of the quantity of food organisms available at any one time for possible utilization by economically important animals such as seals and certain fishes, and marine birds. It does not, however, give a measure of the rate at which the animals die and are replaced, a knowledge which is vital to optimal exploitation of fisheries possibilities in the regions concerned.

Despite serious but unavoidable limitations in dredging methods, the author demonstrated what kinds of animals are most widely distributed, which are in densest concentration, and which are individually heaviest. From sampling data he selects dominant organisms and associated species which typify certain subtidal levels, depending on major factors such as bottom sediments, hydrographic conditions, and latitude. Extending beyond the relatively barren shore zone (0-3 metres) of ice-scouring, to a depth of more than twenty metres in most localities, are various *Macoma* (bivalve mollusc) communities, but these change markedly to *Foraminifera* and *Astarte crenata* communities below fifty metres. The *Macoma* communities, exposed to positive (low arctic) temperatures and relatively rich nutrient supply in summer, exhibit high standing crops (200 grams

per square metre) whereas the *foraminifera* communities, existing in year-round negative (high arctic) temperatures and smaller food supply have much lower standing crops. Despite comparable standing crops between arctic and warmer marine regions, the rate of infaunal production in the arctic is probably less owing to the long life of dominant arctic species, the small number of species reproducing by pelagic larvae, and the low weight of predators.

Although a little too technical for the lay reader and lightly sprinkled with minor mechanical flaws and unusual choice of words, this paper ranks as a major contribution to our knowledge of arctic marine benthic animal communities. His tabulated and appended list of species, fairly free of 'suspect' identifications but perhaps not sufficiently detailed for pertinent taxonomists, reveals the author's ready familiarity with the various invertebrate phyla. Although he has relied fairly heavily on the earlier work of Dunbar, McGinitie, and Thorson, among others, for several basic concepts, he is to be commended for the neat interpretation of the peculiar communities which he encountered during his four-year exploration of the region, and for his good general grasp of problems relating to arctic marine ecology.

E. L. BOUSFIELD

Dr. Bousfield is the Invertebrate Zoologist at the National Museum, Ottawa.

* * *

A History of Ancient Geography by Edward Herbert Bunbury

(Dover Publications Incorporated,
New York. 1,409 pp. \$12.50)

It would take a scholar of equal standing with Sir Edward Herbert Bunbury to write an adequate review of his monumental work on classical geography, and such men are scarcely to be found nowadays, for he devoted himself to classical geography, both mythical and factual, with a thoroughness that makes his work the main standard authority on that subject. Through his studies he was in a position to bring to his task a degree of classical scholarship very rare amongst geographers and it is to be doubted if any other writer has approached this subject so well equipped to handle it in every detail. This gives the reader complete confidence in his imaginative reconstructions and farsighted hypotheses when he touches on the misty borderland of early legend and the dawn of known facts. He guides us with assurance throughout the nebulous world that stretches between Homer and Ptolemy.

(Continued on page VII)



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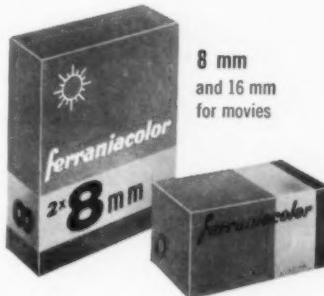
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(Continued from page VI)

Universities, libraries and students of today are indebted to the Dover Publications of New York for their fine reissue of this outstanding work, in a well presented, clearly printed edition of two volumes, comprising 1,409 pages. Except in places where modern archaeological research has brought to light new and relevant data, perhaps no one today is in a position to offer criticism on the work of a man who was so great a master of his craft, but one is glad to read a new introduction by Dr. W. H. Stahl of Brooklyn College, in addition to the author's own modest preface by which he set out the purpose of his work when it was first published in 1879, and it is a special tribute to his literary powers that he never allowed his erudition to obscure the attractiveness or lucidity of his style.

SYLVIA SEELEY

* * *

Atlas of the Arab World and the Middle East

Introduction by C. F. Beckingham
(Macmillan of Canada. \$6.00)

The countries represented in this atlas do not constitute a geographical, political or religious unit. Eleven pages are devoted to a Physical/Political representation of the Arab world on a scale of 1:16M; climate and minerals at a scale of 1:36M and a series of 1:25M shows natural vegetation, density of population, peoples and air routes. Two historical maps at a scale of 1:25M show territorial development in the second half of the nineteenth century and at the eve of the Second World War. Pages twelve and thirteen show various town plans and settlement types on scales ranging from 1:20,000 to 1:200,000, the next nine pages of maps cover northwest Africa and entail Libya, Egypt, the Nile Region and the Sudan; the near East encompasses Syria, Lebanon and Jordan; Iraq, the Arabian Peninsula, Iran and Turkey are efficiently dealt with in the remaining pages.

An introduction follows the map sheets dispersed through forty-two black and white photographs over the final twenty pages. The forty pages of highly coloured maps were produced by Djambatan of Amsterdam and are not overly conspicuous in a general purpose atlas but there is some evidence of careless editing. In the density of population map on page six the colour legend representing a density of 5-50 inhabitants per square mile does not appear to be in keeping with the ratio of other population categories. The preface warns us that there may be discrepancies due to the different quality of available

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In the same issue, Mrs. Way (Beryl W. Way) will describe "Upper Canada Village", which has been designed to present in living form a picture of the way of life in the early settlements of the United Empire Loyalists along the St. Lawrence.

Information and Enquiries About Membership

May we suggest that you tell your friends about the forthcoming June issue so that they may become members of the Society in time to enjoy reading about this fascinating episode in Canadian history? We would welcome them into our growing list of members who are finding through the pages of the *Canadian Geographical Journal* an increasing interest in the history and development of Canada as conditioned by her geography.

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(Continued from page VII)

able data, but, whatever the excuse, there are noticeable inconsistencies such as the use of machine and hand lettering on the same portrayal.

The reviewer is in great sympathy with anyone who attempts the publication of an atlas. Mistakes are apparently unavoidable despite meticulous care by compilers and cartographers but the crowning ignominy is that the publisher of today often finds his maps obsolete on the very day of publication. In an area where political and administrative boundaries may change almost overnight the threat of obsolescence is omnipresent and in the turmoil of today's problems, there are too many unresolved boundaries.

S. C. WILEY

Dr. S. C. Wiley was until recently head of the Foreign Geography Division in the Department of Mines and Technical Surveys at Ottawa.

* * *

Sails of the Maritimes
by James P. Parker, M.B.E.,
Master Mariner

(The Maritime Museum of Canada, Halifax, Nova Scotia. 226 pp. \$5.00)

This fascinating book written by the Superintendent of Pilots at Sydney, Nova Scotia is indeed a most valuable contribution to the maritime records of the Canadian nation. It presents a complete and accurate record of the schooners built in Atlantic Canada, from their origins in the past century, to their passing into oblivion during our own nuclear-ridden age.

A criterion of the value of this book may be gained from the fact that the Canada Council granted assistance to Captain Parker during its six years of preparation and that it is also sponsored by the Maritime Museum of Canada.

There must be few people with the capacity for the extended research essential to the success of books like *Sails of the Maritimes*. Captain Parker has combined this capacity with the happy ability to present his book in a highly readable manner. It is also noted that he has avoided the pitfalls of excessive technical nomenclature and yet at the same time the book provides a means of reference not available anywhere else.

Students of the Canadian maritime scene will be well aware of Captain Wallace's *Wooden ships and iron men*. This reviewer has no doubt that Captain Parker's book of the fore-and-afters, *Sails of the Maritimes* will occupy a position in marine lore at least equal to that of Captain Wallace's parallel record of Canadian built square-riggers. It is significant that

both of these shipmaster authors had practical experience in the wind-ships of which they wrote so well, and that they were also firm friends.

The illustrations, photographs and drawings alike, greatly enhance the pages of the book and Maritimers in particular will find it difficult not to recognize at least one familiar scene amongst them.

The general public will wonder at the hardships which were the daily lot of the schooner-men, but more than this, they will be amazed at the quality of courage that was common to man and boy alike and which shines throughout the pages of *Sails of the Maritimes*.

FRED J. BULLOCK

Captain Bullock, author of Ships and the Seaway, works in the Nautical Safety Division of the Department of Transport at Ottawa.

* * *

Recently Received from Publishers

Huron-Wyandot Traditional Narratives. By Marius Barbeau. (Bulletin 165, National Museum of Canada). This valuable contribution to the Anthropological Series is of special interest as it gives the narratives side by side with the Native texts in the Indian language.

* * *

The Geological Evolution of North America. By Thomas H. Clark and Colin W. Stearn. (The Ronald Press Company, New York). This is a regional approach to historical geology designed for senior students who are familiar with physical geology. It contains abundant illustrations and references.

* * *

Physical Geography. By Arthur N. Strahler. (John Wiley and Sons, New York). This is a new and much enlarged edition of a popular standard work that is much used in American Universities. It has a new and interesting approach to the subject.

* * *

Case Studies in World Geography. Edited by Richard M. Highsmith Jr. (Prentice Hall Incorporated, N.J.) A useful collection of data concerning the methodical handling of geographical facts for practical presentation.

* * *

Greg's Choice. By Gregory Clark. (Ryerson Press, Toronto.) This is a selection made by Mr. Clark himself from his own popular articles that deal with every day happenings in rural surroundings.

* * *

The Face of the Earth. By G. H. Dury. (Pelican Edition). A handy and conveniently sized study in geomorphology told with the usual clarity and high standard associated with productions in the Pelican series.

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STAINLESS STEEL SKYSCRAPER

Nickel stainless steel curtain wall panels were used for the new Union Carbide building in Toronto.



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More than 40 tons of nickel stainless steel were used for interior and exterior applications for the new exhibition centre near Paris.



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